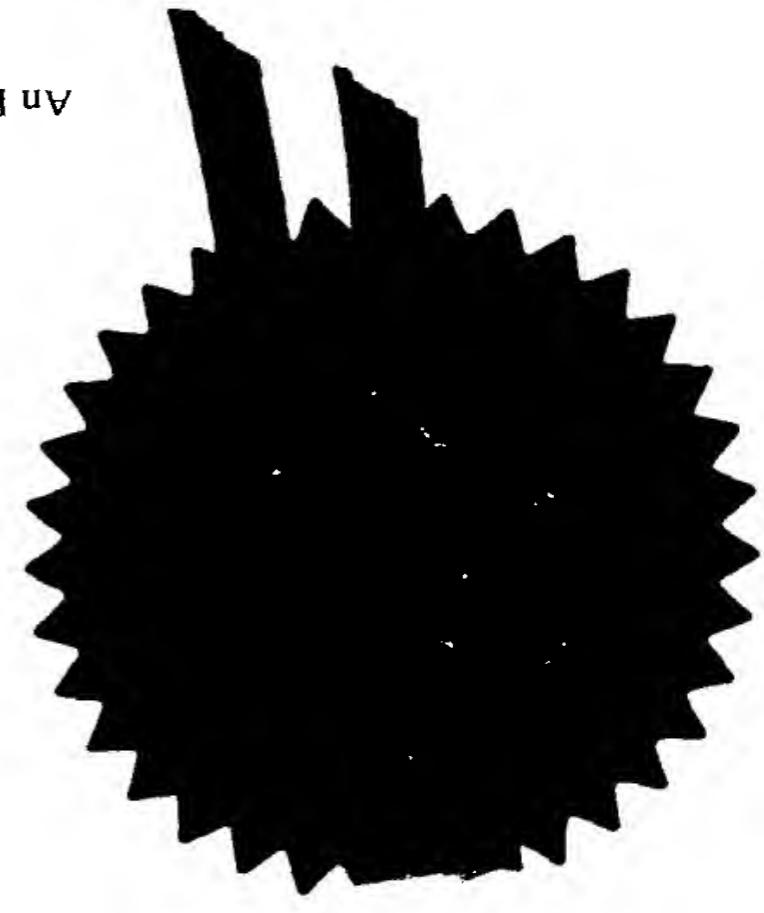


17/05/2000

Dated

Signed

R. Williams



Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, p.l.c. or plc.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusions as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

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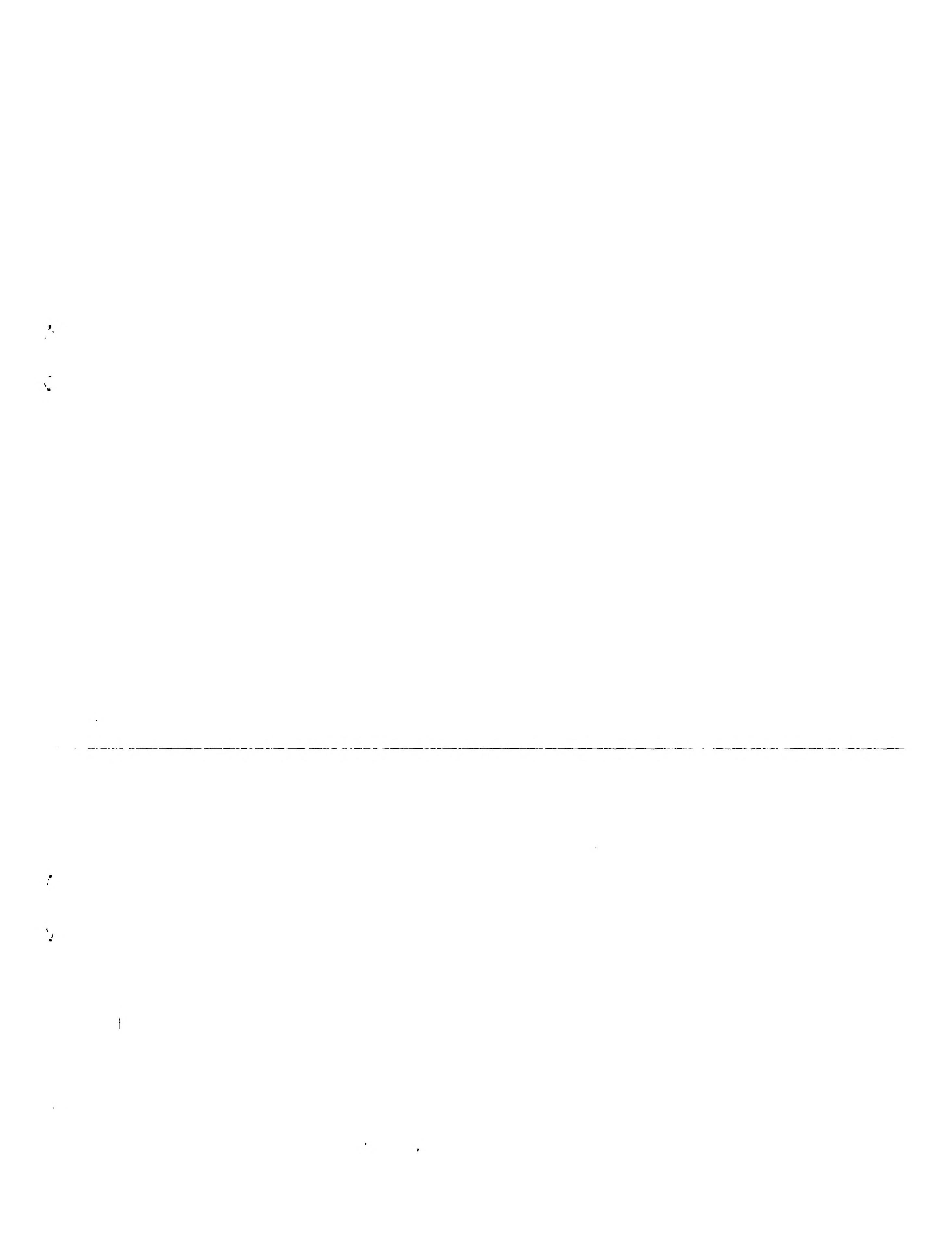
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c) any named applicant is a corporate body;

applicant, or

b) there is an inventor who is not an inventor, or

a) any applicant named in part 3 is not an inventor, or

this request (answer 'yes', if:

to grant of a patent required in support of

is a statement of invention and of right

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Wynne-Jones, Laine & James

22 Rodney Road
Chesterfield GL50 1JT
Gloucestershire GL50 1JT

1792001

5. Name of your agent (if you have one)

Gas Delivery System

4. Title of the invention

Surface Technology Systems

3. Full name, address and postcode of the or of

each applicant (underline all summaries)

If the applicant is a corporate body, give the

country/state of its incorporation

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NP1 9UD

Newport

Gwent

NP1 9UD

United Kingdom

Patents ADP number (if you know it)

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2. Patent application

(The Patents Office)

9904925.6

3. Full name, address and postcode of the or of

each applicant (underline all summaries)

If the applicant is a corporate body, give the

country/state of its incorporation

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4. Your reference

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George M

12. Name and daytime telephone number of person to contact in the United Kingdom
Mr. S.C. Eastwood (01242) 515807

Willy - John, late of 147 Highgate Street - Atch March 1999

We request the grant of a patent on the basis of this application.

Any other documents
(Please specify)

Request for substantive examination

Request for Preliminary Examination and Search Patent Form 9/77

Statement of investorship and right

Translations of primary documents

Priority documents

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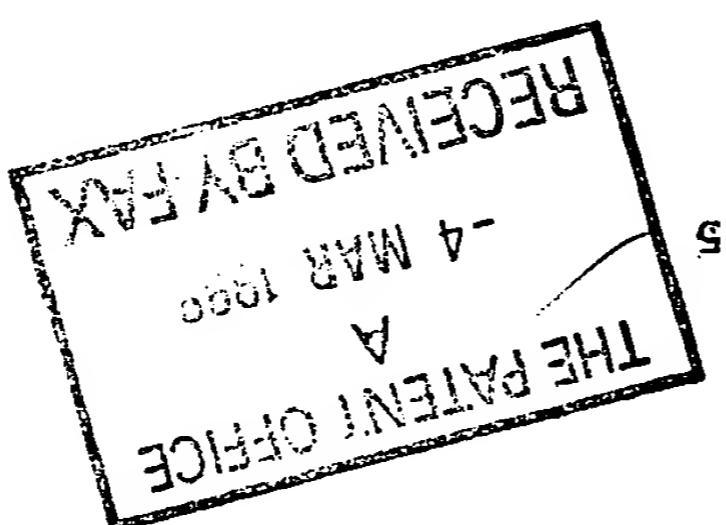
Abstract

ચાલ (૧)

Description

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safe transportation and storage of the units.

25 gas generators contain a solid when cold and this allows for gases to high purity and at a reasonable cost and risk. The chlorotrifluoride. They are able to generate the process generators include fluorine, nitrogen trifluoride and just being made commercially available. These gas molten electrolyte gas generators have been reported and are the installation too hazardous. Lastly, a number of economics of implementing these chemistries extreme and/or commercial availability. These factors combine to make the increased cobalt, greater heat and safety risks and poor candidates to enhance the process rate. All suffer from several different chemistries are known to be likely process rates.

10 active species in the process chamber resulting in improved processes each gases which allow an increase in density of processes have led to the investigation of alternative chemistry. The industry demands for higher each processes uses sulfur hexafluoride as the standard each processes on a semiconductor wafer or the like.

15 dry process continuous and switchable each/deposition switched each/deposition cycle or continuous process is used plasma processing apparatus, for example one in which a particulary, although not exclusively, one for use in a This invention relates to a gas delivery system,

Gas Delivery System

b) depositing a passivation layer on the surface of an
a) etching the substrate with a gas;

comprising cyclically performing the following steps:

25 there is provided a method of treating a substrate according to a third aspect of the present invention,
the chamber.

is delivered from a delivery system positioned locally to
chamber in which the substrate is situated, wherein the gas
20 comprising providing an etch and/or deposition gas to a
chamber in which the substrate is situated, wherein the gas
there is provided a method of treating a substrate
according to a second aspect of the present invention,
supply for a number of apparatuses.

with a particular apparatus rather than being a central
15 "locally" means that the delivery system is associated
system is positioned locally to the chamber.

and/or deposition gas into the chamber, wherein the delivery
a substrate and delivery system for delivering an etching
apparatus comprising a chamber, a support for
10 invention there is provided an apparatus for treating a
thus, according to a first aspect of the present
ease of installation and process advantages.

system design, gas delivery control, system transportation,
generators to a dry processing environment in terms of
5 there are many novel aspects to the application of these gas
variety of process schedules to achieve a process advantage.
capability to introduce different processes gases into a
delivery system local to the process chamber allows a novel
gas incorporation of these gas generators into a

- Safety issues compared to the conventional cylinder.
- Indeed, the gases can be mixed with SF₆ or other known trifluoride or chlorotrifluoride or mixtures thereof.
- Wherein the etching gas comprises fluorine, nitrogen etched feature,
- c) selectively removing the passivation layer from the etched feature; and
1. The generators operate at atmospheric pressure eliminating the need for high pressure regulators on the system.
2. There is no potentially hazardous gas in the system.
3. At room temperature the gas generators have a solid reduced.
4. The local delivery on demand eliminates long gas lines from a central store on the installation and the associated risks of hazardous gases in these pipes.
- Reduced cost of installation of the gas generators compared to conventional cylinder delivery.
1. The local delivery system eliminates the expense to add additional long gas lines from a central store on the installation to the processing environment.

Application No. 9805927.2). The gas generator can be used to
25 1. Continuous operation dry processing (British Patent

Following co-pending applications:

It is envisaged that the invention can be used in our

before passing into the process chamber.

polish the generated gas to remove unwanted impurities
20 4. Included in the local delivery system is the ability to
the gas generators operation on the overall system.

the processes chamber. This is an important design feature of
that the generator does not see the low pressure (vacuum) at

processes chamber incorporates a novel control system such
15 atmospheric pressure. The design of the gas line to the

3. The gas generators are only designed to be operated at
design of the system to avoid any possible recombination.

potentially explosive reactive but are separated by the
the cathode of the electrolytic cell. The two gases are

10 2. The gas generators produce a gas at both the anode and
of the normal hot water bath.

1. A totally dry method of heating the electrolyte instead
be:

Features of this novel use of the gas generators may

any maintenance operations.

the safety precautions needed to protect the operator during
3. The close proximity to the process equipment minimises

typically comparable to the high pressure cylinders.

2. The production of the process gas from the generator is

schedule.

or other of the process steps in the overall process
a process schedule which may only require a plasma for one
react with the substrate, allows the capability to introduce
a plasma to produce the reactive species or spontaneously
generate gases or combine gas mixtures which either require
Applicant Nos. 9815931.2 and 9823364.6. The ability to
switched process similar to that in British Patent
used in the generation of gases for a plasma/plasma-less
In addition, it is envisaged that the invention can be
plasma in the process chamber.

gas will also allow the operation of the process without
substrate, substitution of the sulfur hexafluoride process
where the generated gas spontaneously reacts with the
(British Patent Applications Nos. 9815931.2 and 9823364.6).

3. Alternative gas for the plasma-less switched process
hexafluoride.

individually or in combination with the existing sulfur
advantageously used to enhance the process etch rate either
gas e.g. fluorine or nitrogen trifluoride can be
etch gas used in the switched plasma process. The generated
allows the replacement of addition of the generating gas
0822584 and EP-A-0822582). The addition of the generated gas
2. Alternative gas for the switched plasma processes (EP-A-
generated gas reacts spontaneously with the substrate.

generate reactive species or without a plasma where the
processes chamber. This may involve the use of a plasma to
empty a process gas to etch substrates placed in the

30/3/08

Wynne-Jones + house → Jones

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